

U.S.S.N. 09/714,469
Filed: November 16, 2000
PRELIMINARY AMENDMENT

Rejection Under 35 U.S.C. § 102

The original claims 42-49 were rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 5,753,782 to Hammond et al. ("Hammond"). Applicants respectfully traverse this rejection if applied to the new claims.

Hammond

Hammond is directed to a polyester composition formed of a biodegradable polyester and a plasticising quantity of a **plasticiser** (col. 1, lines 28-42). The plasticiser is one of high-boiling organic molecules, phosphoric acid derivatives, phosphorous acid derivatives, or phosphonic acid derivatives (col. 1, lines 31-42). Hammond also provides that other **usual** materials such as a nucleant can be added to the composition (col. 6, lines 48-53). Therefore, the critical aspect of Hammond is the use of one or more of the plasticisers defined therein (col. 1, lines 28-42).

Hammond generally requires a polyester having units as defined at col. 2, lines 24-41. Preferred polyester is PHB or copolymer PHBV (col. 2, lines 36-37). Hammond does not specifically disclose poly(3-hydroxybutyrate-co-4-hydroxybutyrate).

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The Claimed Invention

In contrast, new claims 50-75 are drawn to a composition, and articles formed thereof, comprising poly(3-hydroxybutyrate-co-4-hydroxybutyrate) and a nucleant with no plasticizer. Claims 50-75 do not require and specifically exclude the use of a plasticiser. Claims 50-75 have explicit support in Examples 1 and 24. As Examples 24-26 at pages 33 and 34 demonstrate, the polymer composition thus formed have excellent physical properties such as good ductility, versatility, and aging characteristics (see Table 7) even without the use of a plasticiser.

Therefore, the claimed composition and the articles formed thereof differ from the composition defined in Hammond at least in two aspects: (1) the claimed composition does not require a plasticiser, which is critical to the composition defined in Hammond, and (2) the claimed composition requires a copolymer which is not specifically disclosed by Hammond.

As such, Hammond does not anticipate claims 50-75 under 35 U.S.C. § 102(e) (see, *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); MPEP § 2131).

As a support for the rejection, the Examiner pointed out, at p. 2, paragraph 7 of the Office Action mailed June 14, 2002, that the specification of the present application at p. 10, lines 1-22, especially lines 20-21 discloses PHB. However, the claims rather than the disclosure define the claimed subject matter under examination (see, *IMS Technology, Inc. v. Haas Automation, Inc.*, 206 F.3d 1422, 54 USPQ2d 1129 (Fed. Cir. 2000).

Furthermore, the question of whether the specification describes additional subject matter

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other than the claimed subject matter is irrelevant to the issue of anticipation under 35 U.S.C. § 102.

Rejection under 35 U.S.C. 103

The original claims 42-49 were rejected under 35 U.S.C. 103 over Hammond. The applicants respectfully traverse the rejection if it is applied to the new claims 50-75. As discussed above, Hammond requires the use of one or more plasticisers to improve the processability of the polyesters defined therein (col. 1, lines 24-27). This critical element is clearly missing from the new claims. Yet, as shown in Examples 24-26 described on pages 33-34, the claimed polymer has an excellent versatility, i.e., ductility, elongation rate, and aging characteristics (see Table 7). This clearly establishes that the new claims are non-obvious over Hammond (see, *In re Edge*, 359 F.2d 896, 149 USPQ 556 (CCPA 1966); see also MPEP § 2144.04(II)(B)).

Moreover, the fact that Hammond is directed to the use of a plasticiser to improve the processability of the polyester described therein indicate that Hammond does not provide one of ordinary skill in the art the motivation to make and use a polyester composition with no plasticiser. Even if one argued the Hammond did provide such as motivation, one still would not have a reasonable expectation of success of the new claims because, as discussed above, the use of one or more plasticisers is critical to the composition described in Hammond. As such, Hammond would not render claims 50-75 *prima facie* obvious under 35 U.S.C. 103 (see, *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986); see also MPEP § 2141).

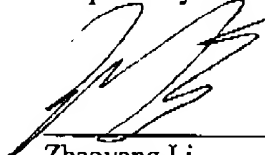
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As such, new claims 50-75 are non-obvious over Hammond.

Further, new claims 50-75 are JP 6157878A2, which describes a resin formed of poly-3-hydroxybutyrate-co-4-hydroxybutyrate and a nucleant. The polymer has 97-85 mol% of 3HB and 3-15% of 4HB. The resin has 0.5 – 3 wt% of boron nitride particles. The composition has excellent impact and heat resistances. There is no disclosure that the resin is capable of having good elongation. As one of ordinary skill in the art would recognize, the ability of a composition to have good elongation hinges on not only the composition itself, but also physical properties of the composition, e.g., crystallinity. Therefore, the new claims 50-75 are novel and non-obvious over JP 6157878A2.

The applicants honestly solicit the allowance of claims 50-75.

Respectfully submitted,



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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this paper, along with any paper referred to as being attached or enclosed is being facsimile transmitted to the U. S. Patent and Trademark Office on the date shown below.

Peggy D. Bailey
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Date: February 25, 2003

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Appendix I: Marked-up Copy of Claims as Pending

Please cancel claims 42-49.

50. (new) A polymer composition comprising poly-3-hydroxybutyrate-co-4-hydroxybutyrate (P3HB4HB) and a nucleant with no plasticizer, wherein the percentage of 4-hydroxybutyrate (4HB) in the P3HB4HB is between 16% and 99%.
51. (new) The composition of claim 50 wherein the nucleant is boron nitride.
52. (new) The composition of claim 50 wherein the nucleant is present at levels between 0.1 and 20 wt% of the blend.
53. (new) The composition of claim 50 wherein the nucleant is present at levels between 1 and 10 wt% of the blend.
54. (new) A method of producing a shaped polymeric object comprising melting a composition comprising poly-3-hydroxybutyrate-co-4-hydroxybutyrate (P3HB4HB) wherein the percentage of 4-hydroxybutyrate (4HB) in the P3HB4HB is between 16% and 99% and a nucleant with no plasticizer, and
producing a shaped object therefrom by extrusion, molding, coating, spinning, blowing, thermoforming or calendaring processes or combinations of the processes.
55. (new) The method of claim 54 wherein the nucleant is boron nitride.
56. (new) A shaped object made according to claim 54.
57. (new) A shaped object made according to claim 55.
58. (new) A polymer composition comprising poly-3-hydroxybutyrate-co-4-hydroxybutyrate (P3HB4HB) and a nucleant with no plasticizer, wherein the nucleant is

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59. (new) The composition of claim 58 wherein the nucleant is boron nitride.

60. (new) A method of producing a shaped polymeric object comprising melting a composition comprising poly-3-hydroxybutyrate-co-4-hydroxyutyrate (P3HB4HB) and a nucleant with no plasticizer, and producing a shaped object therefrom by extrusion, molding, coating, spinning, blowing, thermoforming or calendaring processes or combinations of the processes,

wherein the nucleant is present at a level of 0.1 wt% of the composition.

61. (new) The method of claim 60 wherein the nucleant is boron nitride.

62. (new) A shaped object made comprising the composition of claim 59.

63. (new) A shaped object made according to claim 60.

64. (new) A polymer composition comprising poly-3-hydroxybutyrate-co-4-hydroxyutyrate (P3HB4HB) and a nucleant with no plasticizer wherein the composition is capable of forming a film having elongation.

65. (new) The composition of claim 64 wherein the elongation is in the range between 560 % and 1100 %.

66. (new) The composition of claim 64 wherein the nucleant is present at a level between 0.1 and 20 wt% of the composition.

66. (new) The composition of claim 64 wherein the nucleant is present at a level between 1 and 10% of the composition.

67. (new) A method of producing a shaped polymeric object comprising melting a composition comprising poly-3-hydroxybutyrate-co-4-hydroxyutyrate (P3HB4HB) and

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molding, coating, spinning, blowing, thermoforming or calendaring processes or combinations of the processes,

wherein the composition is capable of forming a film having elongation.

68. (new) The method of claim 67 wherein the elongation is in the range between 560 % and 1100 %.

69. (new) The method of claim 67 wherein the nucleant is present at a level between 0.1 and 20 wt% of the composition.

70. (new) The method of claim 67 wherein the nucleant is present at a level of 1 to 10% of the composition.

71. (new) The method of claim 68 wherein the nucleant is present at a level between 0.1 and 20 wt% of the composition.

72. (new) The method of claim 68 wherein the nucleant is present at a level between 1 and 10% of the composition.

73. (new) The method of claim 67 wherein the nucleant is boron nitride.

74. (new) A shaped article made according to the method of claim 67.

75. (new) A shaped article made according to the method of claim 68.

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Appendix II: Clean Copy of Claims as Pending

50. (new) A polymer composition comprising poly-3-hydroxybutyrate-co-4-hydroxybutyrate (P3HB4HB) and a nucleant with no plasticizer, wherein the percentage of 4-hydroxybutyrate (4HB) in the P3HB4HB is between 16% and 99%.

51. (new) The composition of claim 50 wherein the nucleant is boron nitride.

52. (new) The composition of claim 50 wherein the nucleant is present at levels between 0.1 and 20 wt% of the blend.

53. (new) The composition of claim 50 wherein the nucleant is present at levels between 1 and 10 wt% of the blend.

54. (new) A method of producing a shaped polymeric object comprising melting a composition comprising poly-3-hydroxybutyrate-co-4-hydroxybutyrate (P3HB4HB) wherein the percentage of 4-hydroxybutyrate (4HB) in the P3HB4HB is between 16% and 99% and a nucleant with no plasticizer, and

producing a shaped object therefrom by extrusion, molding, coating, spinning, blowing, thermoforming or calendaring processes or combinations of the processes.

55. (new) The method of claim 54 wherein the nucleant is boron nitride.

56. (new) A shaped object made according to claim 54.

57. (new) A shaped object made according to claim 55.

58. (new) A polymer composition comprising poly-3-hydroxybutyrate-co-4-hydroxybutyrate (P3HB4HB) and a nucleant with no plasticizer, wherein the nucleant is present at a level of 0.1 wt% of the composition.

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60. (new) A method of producing a shaped polymeric object comprising melting a composition comprising poly-3-hydroxybutyrate-co-4-hydroxyutyrate (P3HB4HB) and a nucleant with no plasticizer, and producing a shaped object therefrom by extrusion, molding, coating, spinning, blowing, thermoforming or calendaring processes or combinations of the processes,

wherein the nucleant is present at a level of 0.1 wt% of the composition.

61. (new) The method of claim 60 wherein the nucleant is boron nitride.

62. (new) A shaped object made comprising the composition of claim 59.

63. (new) A shaped object made according to claim 60.

64. (new) A polymer composition comprising poly-3-hydroxybutyrate-co-4-hydroxyutyrate (P3HB4HB) and a nucleant with no plasticizer wherein the composition is capable of forming a film having elongation.

65. (new) The composition of claim 64 wherein the elongation is in the range between 560 % and 1100 %.

66. (new) The composition of claim 64 wherein the nucleant is present at a level between 0.1 and 20 wt% of the composition.

66. (new) The composition of claim 64 wherein the nucleant is present at a level between 1 and 10% of the composition.

67. (new) A method of producing a shaped polymeric object comprising melting a composition comprising poly-3-hydroxybutyrate-co-4-hydroxyutyrate (P3HB4HB) and a nucleant with no plasticizer, and producing a shaped object therefrom by extrusion,

molding, coating, spinning, blowing, thermoforming or calendaring processes or combinations of the processes,

wherein the nucleant is present at a level of 0.1 wt% of the composition.

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wherein the composition is capable of forming a film having elongation.

68. (new) The method of claim 67 wherein the elongation is in the range between 560 % and 1100 %.

69. (new) The method of claim 67 wherein the nucleant is present at a level between 0.1 and 20 wt% of the composition.

70. (new) The method of claim 67 wherein the nucleant is present at a level of 1 to 10% of the composition.

71. (new) The method of claim 68 wherein the nucleant is present at a level between 0.1 and 20 wt% of the composition.

72. (new) The method of claim 68 wherein the nucleant is present at a level between 1 and 10% of the composition.

73. (new) The method of claim 67 wherein the nucleant is boron nitride.

74. (new) A shaped article made according to the method of claim 67.

75. (new) A shaped article made according to the method of claim 68.

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